

# NASA TECH BRIEF



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## Determination of Quadric Equation Coefficients Describing Three-Dimensional Surfaces, their Constraint and Skewed Planes, and View Point Areas

Systems analysts, numerical control machine tool engineers, and scientific programmers concerned with procedures for the display of three-dimensional objects will be interested in a mathematical model that has been devised and a digital computer BLITZ language programming technique that has been developed for computing coefficients of quadric equations describing either cylinders, cones, paraboloids, ellipsoids (or spheres), or planes with any orientation to a reference coordinate system; coordinates of a vector from the reference system defining the center of an area (referred to as a view point) and its associated area; and coefficients of quadric surfaces which limit the surface in three-dimensional space.

The mathematical model is straightforward and employs 107 equations and 18 figures. Data generated by this model is used in orbital environment studies and, when added to an existing environmental computer program, can generate the ambient en-

vironment of a body in orbit. The model can be modified to suit other requirements. It may also serve as a pattern for further automation of manual computational procedures.

### Note:

Documentation is available from:

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### Patent status:

No patent action is contemplated by NASA.

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